

Attenuation Relations for Peak and Response Spectra of Horizontal Acceleration from Strong-motion Records for the Main Seismic Zones of the Iranian Plateau

JAFAR Shoja-Taheri, Khorosan Earthquake Center, Ferdowsi University of Mashad, Mashad, Iran, j-shoja@seismo.um.ac.ir

Attenuation relationships for the peak horizontal ground acceleration (PHA) and for the response spectra of the horizontal ground acceleration (RSHA) for the main seismic zones of the Iranian plateau (i.e., Alborz, Zagros, and Eastern Iran) have been developed. The region bounds from 24 to 40 degrees north latitude, and from 44 to 62 degrees east longitude. The selected data consist of 447 ground horizontal acceleration records from 233 earthquakes with $M = 4.0$ to $M = 7.4$ recorded by the Iranian strong-motion network. The recording distances range from 3 to 450 km. The method of present analysis follows the two-step procedure used by Joyner and Boore (1981) with the following general form:

$$\log(A) = a + bM - \log(r) - cr$$

$$r = (d^2 + h^2)^{1/2} \quad 4.0 < M < 7.4,$$

where A is either PHA or RSHA in cm/sec/sec, M is the moment magnitude, d is the closest distance to the surface projection of the fault rupture in kilometers, and a , b , c and h are the parameters to be evaluated. The table below gives the parameters for the aforementioned zones. Standard deviation of each regression is also given. RSHA2 and RSHA3 are the pseudo responses of horizontal acceleration at 0.2 and 0.3 seconds with 5% of critical damping, respectively.

Zone	A	a	b	c	h	sd
Albotz	PHA	1.028	0.402	0.00170	14.20	0.253
	RSHA2	1.241	0.439	0.00234	21.90	0.257
	RSHA3	0.598	0.542	0.00260	28.22	0.276
Eastern Iran	PHA	0.899	0.392	0.00056	06.63	0.212
	RSHA2	0.659	0.492	0.00068	06.63	0.242
	RSHA3	0.373	0.521	0.00030	09.50	0.233
Zagros	PHA	0.721	0.436	0.00300	02.67	0.318
	RSHA2	0.277	0.484	0.00316	03.55	0.371
	RSHA3	-0.644	0.721	-0.00169	03.04	0.365